

NOVEMBER/DECEMBER 2025

23USBC43 — BIOINFORMATICS

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define bioinformatics.
2. What is the difference between genome and metabolome?
3. Name one metabolome database.
4. Define transcriptome.
5. What is the purpose of a nucleotide sequence database?
6. Name one protein sequence database.
7. What is BLAST?
8. Outline the principles of DNA micro array
9. Define Nutrigenomics.
10. What is RASMOL?



SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Compare and contrast the different types of biological databases.

Or

- (b) Discuss the importance of metabolome databases in bioinformatics.

12. (a) Explain the procedure of DNA microarray and its applications.

Or

- (b) Describe the features and applications of the KEGG database.

13. (a) Compare and contrast the different types of sequence alignment methods.

Or

- (b) Discuss the importance of structural genomics in bioinformatics.

14. (a) Explain the applications of DNA microarray.

Or

- (b) Describe the features of BLAST.

15. (a) Compare and contrast the different types of genomic tools for genome comparison.

Or

- (b) Discuss the importance of nutrigenomics in bioinformatics.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Design a bioinformatics workflow for genomic data analysis.

17. Compare nucleotide, protein, and metabolic databases and explain their importance.

18. Elucidate on the heuristic methods of sequence alignment.

19. Explain DNA microarray procedure, applications, advantages and limitations.

20. Elaborate on molecular visualizations tools.

